TABLE 1-5 The Seven Fundamental Units of Measurement (SI)

Physical Property	Name of Unit	Symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
temperature	kelvin	K
luminous intensity	candela	cd
amount of substance	mole	mol

TABLE 1-6 Common Prefixes Used in the SI and Metric Systems

Prefix	Abbreviation	Meaning	Example
mega-	M	10^6	1 megameter (Mm) = 1×10^6 m
kilo-*	k	10^3	1 kilometer (km) = 1×10^3 m
deci-	d	10^{-1}	1 decimeter (dm) = 1×10^{-1} m
centi-*	c	10^{-2}	1 centimeter (cm) = 1×10^{-2} m
milli-*	m	10^{-3}	1 milligram (mg) = 1×10^{-3} g
micro-*	μ†	10^{-6}	1 microgram (μg) = 1×10^{-6} g
nano-*	n	10^{-9}	1 nanogram (ng) = 1×10^{-9} g
pico-	p	10^{-12}	1 picogram (pg) = 1×10^{-12} g

*These prefixes are commonly used in chemistry.

†This is the Greek letter μ (pronounced "mew").

The prefixes used in the SI and metric systems may be thought of as *multipliers*. For example, the prefix *kilo-* indicates multiplication by 1000 or 10^3, and *milli-* indicates multiplication by 0.001 or 10^{-3}.

TABLE 1-8 Conversion Factors Relating Length, Volume, and Mass (weight) Units

	Metric		English		Metric–English Equivalents	
Length	1 km	$= 10^3$ m	1 ft	= 12 in.	2.54 cm	= 1 in.
	1 cm	$= 10^{-2}$ m	1 yd	= 3 ft	39.37 in.*	= 1 m
	1 mm	$= 10^{-3}$ m	1 mile	= 5280 ft	1.609 km*	= 1 mile
	1 nm	$= 10^{-9}$ m				
	1 Å	$= 10^{-10}$ m				
Volume	1 mL	$= 1\ cm^3 = 10^{-3}$ L	1 gal	= 4 qt = 8 pt	1 L	= 1.057 qt*
	1 m^3	$= 10^6\ cm^3 = 10^3$ L	1 qt	= 57.75 $in.^{3*}$	28.32 L	= 1 ft^{3*}
Mass	1 kg	$= 10^3$ g	1 lb	= 16 oz	453.6 g*	= 1 lb
	1 mg	$= 10^{-3}$ g			1 g	= 0.03527 oz*
	1 metric tonne	$= 10^3$ kg	1 short ton	= 2000 lb	1 metric tonne	= 1.102 short ton*

*These conversion factors, unlike the others listed, are inexact. They are quoted to four significant figures, which is ordinarily more than sufficient.

Significant Figure Rules

1) Nonzero digits are always significant.
2) Zeroes are sometimes significant, and sometimes they are not.
   a) Zeroes at the beginning of a number (used just to position the decimal point) are never significant.
   b) Zeroes between nonzero digits are always significant.
   c) Zeroes at the end of a number that contains a decimal point are always significant.
   d) Zeroes at the end of a number that does not contain a decimal point may or may not be significant.
3) Exact numbers can be considered as having an unlimited number of significant figures. This applies to defined quantities.
4) In addition and subtraction, the last digit retained in the sum or difference is determined by the position of the first doubtful digit.
5) In multiplication and division, an answer contains no more significant figures than the least number of significant figures used in the operation.